

# Central<sup>TM</sup> Semiconductor Corp.

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Manufacturers of World Class Discrete Semiconductors  
www.centrasemi.com

2N3970  
2N3971  
2N3972

N-CHANNEL JFET

JEDEC TO-18 CASE

## DESCRIPTION

The CENTRAL SEMICONDUCTOR 2N3970 series types are N-Channel Junction Field Effect Transistors, designed for amplifier, chopping, and analog switching applications.

## MAXIMUM RATINGS (T<sub>A</sub>=25°C)

	SYMBOL		UNITS
Drain-Gate Voltage	V <sub>DG</sub>	40	V
Source-Gate Voltage	V <sub>SG</sub>	40	V
Gate Current	I <sub>G</sub>	50	mA
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	1.8	W
Operating and Storage Junction Temperature	T <sub>J</sub> , T <sub>stg</sub>	-65 to +200	°C

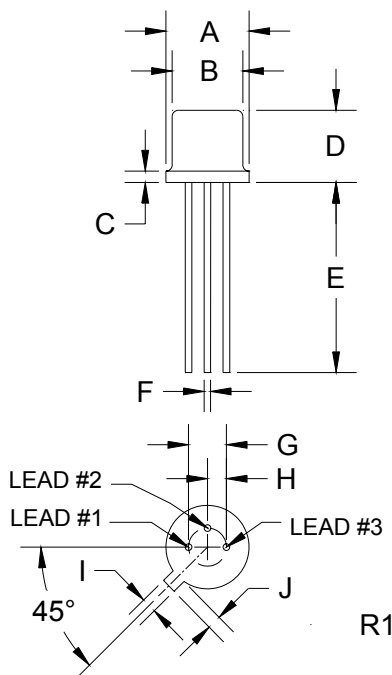
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

SYMBOL	TEST CONDITIONS	2N3970		2N3971		2N3972		UNITS
		MIN	MAX	MIN	MAX	MIN	MAX	
I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	50	150	25	75	5.0	30	mA
I <sub>DGO</sub>	V <sub>DG</sub> =20V, I <sub>S</sub> =0		250		250		250	pA
I <sub>DGO</sub>	V <sub>DG</sub> =20V, I <sub>S</sub> =0, T <sub>A</sub> =150°C		500		500		500	nA
I <sub>D(off)</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =12V		250		250		250	pA
I <sub>D(off)</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =12V, T <sub>A</sub> =150°C		500		500		500	nA
BV <sub>GSS</sub>	I <sub>G</sub> =1.0μA, V <sub>DS</sub> =0V	40		40		40		V
V <sub>GS(off)</sub>	V <sub>DS</sub> =20V, I <sub>D</sub> =1.0nA	4.0	10	2.0	5.0	0.5	3.0	V
V <sub>DS(on)</sub>	I <sub>D</sub> =20mA, V <sub>GS</sub> =0V		1.0		-		-	V
V <sub>DS(on)</sub>	I <sub>D</sub> =10mA, V <sub>GS</sub> =0V		-		1.5		-	V
V <sub>DS(on)</sub>	I <sub>D</sub> =5.0mA, V <sub>GS</sub> =0V		-		-		2.0	V
r <sub>DS(on)</sub>	I <sub>D</sub> =1.0mA, V <sub>GS</sub> =0		30		60		100	Ω
r <sub>ds(on)</sub>	I <sub>D</sub> =0, V <sub>GS</sub> =0, f=1.0kHz		30		60		100	Ω
C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0, f=1.0MHz		25		25		25	pF
C <sub>rss</sub>	V <sub>DS</sub> =0, V <sub>GS</sub> =12V, f=1.0MHz		6.0		6.0		6.0	pF

(SEE REVERSE SIDE)

SYMBOL	SWITCHING TEST CONDITIONS	2N3970		2N3971		2N3972		UNITS
		MIN	MAX	MIN	MAX	MIN	MAX	
$t_{d(on)}$	$I_{D(on)}=20mA, R_L=450\Omega, V_{GS(off)}=10V$ $V_{DD}=10V, V_{GS(on)}=0$	10		-		-		ns
$t_{d(on)}$	$I_{D(on)}=10mA, R_L=850\Omega, V_{GS(off)}=5.0V$ $V_{DD}=10V, V_{GS(on)}=0$	-		15		-		ns
$t_{d(on)}$	$I_{D(on)}=5.0mA, R_L=1.6K\Omega, V_{GS(off)}=3.0V$ $V_{DD}=10V, V_{GS(on)}=0$	-		-		40		ns
$t_r$	$I_{D(on)}=20mA, R_L=450\Omega, V_{GS(off)}=10V$ $V_{DD}=10V, V_{GS(on)}=0$	10		-		-		ns
$t_r$	$I_{D(on)}=10mA, R_L=850\Omega, V_{GS(off)}=5.0V$ $V_{DD}=10V, V_{GS(on)}=0$	-		15		-		ns
$t_r$	$I_{D(on)}=5.0mA, R_L=1.6K\Omega, V_{GS(off)}=3.0V$ $V_{DD}=10V, V_{GS(on)}=0$	-		-		40		ns
$t_{off}$	$I_{D(on)}=20mA, R_L=450\Omega, V_{GS(off)}=10V$ $V_{DD}=10V, V_{GS(on)}=0$	30		-		-		ns
$t_{off}$	$I_{D(on)}=10mA, R_L=850\Omega, V_{GS(off)}=5.0V$ $V_{DD}=10V, V_{GS(on)}=0$	-		60		-		ns
$t_{off}$	$I_{D(on)}=5.0mA, R_L=1.6K\Omega, V_{GS(off)}=3.0V$ $V_{DD}=10V, V_{GS(on)}=0$	-		-		100		ns

TO-18 PACKAGE - MECHANICAL OUTLINE



DIMENSIONS				
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A (DIA)	0.209	0.230	5.31	5.84
B (DIA)	0.178	0.195	4.52	4.95
C	-	0.030	-	0.76
D	0.170	0.210	4.32	5.33
E	0.500	-	12.70	-
F (DIA)	0.016	0.019	0.41	0.48
G (DIA)	0.100		2.54	
H	0.050		1.27	
I	0.036	0.046	0.91	1.17
J	0.028	0.048	0.71	1.22

TO-18 (REV: R1)

LEAD CODE:

- 1) SOURCE
- 2) DRAIN
- 3) GATE

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## OUTSTANDING SUPPORT AND SUPERIOR SERVICES



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### PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

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### DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2<sup>nd</sup> day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

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### REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix "TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix "PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

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### CONTACT US

#### Corporate Headquarters & Customer Support Team

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**Worldwide Field Representatives:**  
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